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POLICY BRIEF

Nepal's Nationally Determined Contributions (NDC 3.0): A water-led climate future

Bimal Raj Regmi, Manohara Khadka, Santosh Nepal

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Authors

Bimal Raj Regmi, Team Leader, ClimAdapt,
Manohara Khadka, Country Representative, International Water Management Institute (IWMI), Nepal
Santosh Nepal, Researcher, IWMI, Nepal

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Front cover photo: A rural mountain valley in Nepal illustrating the water, food, and ecosystem nexus that supports agriculture, settlements, and local livelihoods (*photo*: Santosh Nepal/IWMI)

Back cover photo: Women farmers in Nepal's mountains strengthen climate-resilient agriculture through small-scale irrigation, water management, and sustainable food production practices (*photo*: Nabin Baral/IWMI)

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Summary

The inclusion of water in the latest iteration of Nepal's Nationally Determined Contributions, NDC 3.0, represents a notable success. This was driven by strong leadership from the Ministry of Energy, Water Resources and Irrigation (MoEWRI) and active engagement from the focal ministry, development partners, research partners (International Water Management Institute, IWMI), and other relevant stakeholders. The process relied on rigorous technical assessments, evidence-based analysis, and stakeholder dialogue, which ensured that water resources were strongly integrated across major adaptation priorities sectors. The NDC revision also improved the definition of quantitative and policy targets within the mitigation sector, reflecting an integrated approach to climate action.

Effective implementation of NDC 3.0 will require stronger ownership across federal, provincial, and local governments, together with continued engagement from supporting partners. Priorities and targets need to be clearer and tied to practical actions, backed by adequate financing and stronger institutional capacity. Integrating NDC priorities into regular planning and budgeting processes, while also diversifying resource mobilization, will be important for turning commitments into real actions. At the local level, water management needs to deal with both scarcity and excess water, which directly affects food security, growth and local livelihoods. Clearer roles across the three tiers of government alongside additional capacity building and greater emphasis on localization will help. Equitable benefit-sharing, particularly for persons with disabilities, minority and Indigenous communities, as well as youth, women and other marginalized groups, is also needed if these commitments are to lead to more inclusive and climate-resilient outcomes.

Why water matters in NDCs

Nepal's water resources are vital for its development and climate resilience, but face increasing threats from climate change, poor coordination, weak governance, and sectoral pressures (WECS 2024). Climate change has intensified extreme weather, erratic monsoons, floods, droughts, and water scarcity, impacting agriculture, irrigation, drinking water, hydropower, and ecosystems (Nepal 2024). Rising temperatures disrupt precipitation patterns and increase evaporation, affecting water availability and quality. These shifts strain infrastructure, threaten ecosystems, and risk food and energy security, impeding sustainable growth and widening water disparities (WAREG n.d.).

Integrating water into national climate policies is essential for sustainable development (GWP 2019). The water–energy–food–environment (WEFE) nexus demonstrates that efficient water management benefits energy, agriculture, biodiversity, and carbon sequestration. Approaches like wastewater treatment, wetland and forest conservation, and optimized water use build resilience and reduce emissions (Pokharel et al. 2024). Equitable access to water is fundamental to food and nutrition security, livelihoods, and climate resilience, particularly for women, persons with disabilities, and Indigenous peoples facing disproportionate climate and governance-related risks.

Previous NDCs lacked strong water-related provisions. To fill the policy gaps, the MoEWRI and partners prioritized integrating water targets in NDC 3.0. This brief provides evidence of the inclusive policymaking and leadership behind the incorporation of the WEFE nexus into NDC 3.0, based on policy review, stakeholder consultation, and process observation.

Overview of water inclusion in Nepal's policies and plans

The water sector's role in climate change policies in Nepal remains ambiguous – recognized for its socioeconomic importance but often overlooked in policy documents. The National Climate Change Policy (2019) addresses both water excess and shortage as climate concerns, proposing strategies for conservation and improved quality and availability. Adaptation documents highlight the importance of water management: the National Adaptation Programme of Action (2010) and the National Adaptation Plan (2023) identify it as a top adaptation priority. However, Nepal's initial NDC (2016) barely mentioned water's mitigation potential, and later NDCs (2021) focused mainly on renewable energy and wastewater management, neglecting efficient water management for climate-induced disasters. While the government's net-zero strategy (2022) falls short on water sector integration, the NDC implementation plan (2023) sufficiently incorporates water provisions across major sectors.

Highlights of water integration in NDC 3.0

Overview of the integration process

Nepal's NDC 3.0 integrates water as a central theme, marking significant progress. The Ministry of Forests and Environment (MoFE) led an evidence-based, participatory process, learning from past NDCs and sectoral strategies. Water was recognized not only as a resource but also as essential for agriculture, energy, disaster risk reduction, health, and ecosystems, supporting livelihoods and climate resilience in line with constitutional rights.

The MoEWRI led efforts to include water in NDC 3.0, forming a technical committee and coordinating with relevant agencies. Consultations across all government levels and with stakeholders ensured that water issues were featured in both adaptation and mitigation targets, promoting cross-sectoral coherence.

The Ministry of Energy, Water Resources and Irrigation led sectoral discussions on integrating water sectors in NDC 3.0

Key themes and commitments on water in NDC 3.0

Nepal's NDC sets a single quantitative mitigation target for wastewater: treating 510 million liters daily before discharge. Other policy goals include expanding household solar thermal capacity to 1,354 MWth by 2035; installing methane capture in all 10 industries with anaerobic wastewater treatment by 2035; developing a greenhouse gas (GHG) inventory for water, sanitation, and hygiene (WASH); updating climate standards; revising the Green School Guidelines; providing safe low-carbon water services to 50% of the population by 2030; and significantly increasing both groundwater cluster and lift irrigation using renewable energy by 2035.

The adaptation priorities in Nepal's NDC 3.0 center on water, integrated across energy, agriculture, land use, land-use change, and forestry (LULUCF), waste, WASH, and water resources. Agriculture focuses on expanding irrigation and improving groundwater tracking. Forest and watershed actions target water availability, wetland restoration, riverbank protection, flood risk reduction, and watershed management. Water and energy measures include rainwater harvesting, source protection, river basin management, integrated water resource management (IWRM), water accounting, river and sediment management, glacier monitoring, and water quality checks. Health and WASH efforts emphasize safe water, sanitation, spring conservation, rainwater harvesting, and aquifer recharge. Disaster risk reduction centers on managing glacial lake outburst flood (GLOF) risks with regulated lake flows, early warnings, hazard mapping, real-time monitoring, and better planning. See Table 1 for sector-specific water inclusion details.

Table 1. Inclusion of water across NDC 3.0 thematic areas, Nepal (2025–2035)

Agriculture and Food Security	- Expand irrigation coverage to an additional 463,000 hectares. - Ensure year-round irrigation in 173,000 ha of agricultural area by implementing inter-basin water transfer projects. - Establish 20 automated groundwater monitoring stations for agriculture fields in Terai districts. - Improve water supply through rainwater harvesting, resource protection, and spring conservation and restoration, and watershed health in 20 districts will be enhanced through integrated watershed management projects.
Forests, Biodiversity and Watershed Conservation	- Increase water availability by 50% in sub-watersheds by 2035, conserve and restore 50% of wetlands, and reduce riverbank cutting and flood risks by 60%. - Carry out an inventory of wetlands expanded to 100 wetlands, and additional vulnerable watersheds will be sustainably managed.
Water Resources and Energy	- Construct 200 rainwater conservation reservoirs and 1,000 water source protection schemes. - Develop regulations and guidelines for climate-resilient water resources and irrigation infrastructure. - Improve watershed in 20 districts through integrated management of 164 river systems in Chure. - Develop sustainable management and conservation plans for four river basins and ten independent basins and implemented in three river basins. - Apply IWRM to 60 river systems, including integrated conservation of 50 critical watersheds. - Carry out water accounting to cover 20 sub-basins, with river and sediment management plans for six rivers (applied in three basins) and river management plans for three basins (implemented in one). - Assess change in glacier mass balance study of 20 glaciers. - Establish water quality monitoring and evaluation in major river basins by 2030 for the Koshi and Gandaki river basins, including in the remaining Karnali and Mahakali River basins by 2035. - Restore rainwater harvesting, spring restoration, and implement watershed management in 20 districts to enhance water supply and ecosystem health. - Ensure rainwater harvesting will reach 500,000 households, with groundwater monitoring in 50 sites and Managed Aquifer Recharge in 15 water-stressed areas.
Health, Drinking Water and Sanitation	- Ensure 90% of the population will benefit from safely managed water supply and sanitation services. - Ensure 80% of the population will benefit from spring conservation, restoration, and management. - Explore climate-resilient WASH systems in 3,000 vulnerable households, communities, and systems at the local level by 2030, and 5,000 by 2035. - Formulate climate-resilient WASH plans at all local levels.
Disaster Risk Reduction and Management	- Establish and operationalize 30 additional multi-hazard early warning systems to cover all 7 provinces and major river basins while ensuring 80% of the population living in flood-prone areas will have access to flood early warning systems. - Reduce Glacial Lake Outburst Flood (GLOF) risks through regulated flows in 4 glacial lakes by 2030 and an additional 4 by 2035.

	- Establish Early Warning Systems in 6 glacial lakes by 2030 and an additional 4 by 2035. - Carry out GLOF hazard mapping and implement real-time monitoring of 6 glacial lakes by 2030 and an additional 4 by 2035. - Strengthen GLOF risk reduction planning and action.
Gender Equality, Disability and Social Inclusion (GEDSI)	- By 2035, Technical training programs on adaptation for 200 technical staff of water resources and irrigation sector including GEDSI aspects will be conducted. - Climate-resilient WASH systems will be developed through various technologies explored in 3,000 vulnerable households, communities, and systems at the local level by 2030, and 5,000 by 2035. - By 2030, 50% of the population, including women, children, and socially marginalized groups, will benefit from safely managed and low-carbon water supply services.

Source: NDC 3.0, Government of Nepal

Enabling factors for success

Learning and reflection: Reviewing previous NDCs helped ministries, including the MoEWRI, identify challenges and opportunities to improve water inclusion in NDC 3.0. The government and stakeholders reached consensus on diversifying sectors and prioritizing key areas, such as water resources.

Policy and institutional leadership: The MoFE led the preparation of NDC 3.0, coordinating with sectoral ministries that set their own targets. Proposed targets were reviewed by relevant committees and discussed at the Inter-Ministerial Coordination Committee on Climate Change before Cabinet approval, incorporating input from ministries and the public. The MoEWRI, supported by senior officials and IWMI, oversaw the process to integrate water into NDC 3.0 and make the NDC 3.0 process and outcome inclusive.

Kick-off meeting of the NDC 3.0 process, led by MoFE's Climate Change Management Division

Stakeholder engagement and coordination: NDC 3.0 was developed through an inclusive, country-led process based on the principle "leave no one behind." MoFE worked with ministries, local governments, and a wide range of stakeholders – including communities, Indigenous peoples, women, youth, people with disabilities, civil society, the private sector, experts, academia, development partners, the media, and parliament. This broad engagement fostered ownership and ensured that concerns around water resources were addressed.

Use of evidence, tools and technical support: IWMI supported technical rigor in drafting water sector mitigation and adaptation priorities. The analysis included technical and gender reviews, literature surveys, stakeholder interviews, technical meetings, and workshops to validate evidence and inform decisions. These tools strengthened the participatory approach, ensuring NDC 3.0 was based on robust data and analysis.

First wider consultations with stakeholders for the NDC 3.0 process. (photo: CCMD, MOFE)

Opportunities for inclusion of water targets in NDC 3.0

NDC 3.0 centers water management in its strategy, integrating it into hydropower and irrigation planning to protect energy infrastructure from climate-induced disasters. The plan stresses nature-based solutions and community-led, decentralized water systems to boost climate resilience, reduce disaster risks, and improve local livelihoods. It also uses integrated assessments and monitoring to ensure that interventions are effective for both adaptation and mitigation.

This water-centric approach is designed to attract diverse sources of finance by emphasizing co-benefits such as energy security, food productivity, and biodiversity. Packaging projects such as irrigation and watershed restoration into attractive portfolios lowers investor risk and promotes public–private–community partnerships. Mainstreaming gender, social equity and community benefits within water initiatives outcomes further supports sustainability and funding alignment.

Lessons learned and good practices

What worked and why: Water priorities were included in NDC 3.0 through strong leadership and coordination by MoEWRI, along with engagement from relevant agencies. Technical input from IWMI aided cross-sector integration, while MoFE, youth, and civil society ensured an inclusive process that addressed GEDSI in water targets.

The inclusion aspect of NDC 3.0 is strong. The document integrates gender equality, disability, and social inclusion (GEDSI) principles as key requirements for all water-related adaptation and mitigation projects, including WASH, irrigation, watershed management, and training. The document emphasizes disaggregated data and inclusion of marginalized populations in monitoring and policy implementation. This outcome was achieved through an inclusive co-design process for NDC 3.0 and active engagement of organizations and experts with mandates for GEDSI-inclusive development.

Challenges overcome: The process faced obstacles, including limited baseline data, which complicated setting water mitigation targets due to a focus on adaptation. Water availability affects mitigation in energy, waste, and agriculture, forestry, and other land use sectors, and requires local assessment. National targets often overlook regional differences in water resources, making context-specific planning essential. Mitigation actions are conditional and voluntary, giving the government flexibility to adjust goals with low-carbon opportunities in mind.

Remaining gaps and opportunities: Current NDCs largely overlook water-related risks in climate loss and damage. Not including freshwater in mitigation and adaptation plans could weaken climate resilience and slow net-zero progress. Investing in adaptive water management and clarifying water-focused NDC actions can unlock funding, bolster resilience, and support cross-sectoral goals. Applying the WEFE nexus can maximize the benefits of mitigation, adaptation, and resilience.

Policy and implementation recommendations

Mainstreaming NDCs at the sub-national level: National, provincial, and local governments should be able to track progress on the water-related provisions in NDC 3.0. Effective federalism should distribute resources and build local and provincial capacity for better water governance, enabling integrated, inclusive adaptation and mitigation actions that connect water with disaster and climate initiatives.

Implementation pathways: Effective implementation relies on Nepal's NDC 3.0 Implementation Plan. Past cycles (NDC 1.0 and 2.0) underscored the need for strong institutional coordination, clear roles among ministries, and active stakeholder engagement. The new plan should be concrete, actionable and budgeted, and include detailed financing strategies.

Scaling and sustaining gains: Scaling adaptation and mitigation actions require coherence and collaboration across government levels. Sectoral ministries should align with national priorities and coordinate efforts in water, agriculture, energy, and forestry. Policies must empower local governments, women, youth, and marginalized groups for inclusive, context-specific climate action. Key strategies include assessing successful pilots and innovations and scaling them through public–private–community partnership models, and GEDSI responsive policy and governance, mainstreaming climate into development plans, and strengthening community-based resource management. Examples such as inter-basin water transfers, resilient irrigation, climate-resilient WASH, solar-powered water systems, farmer-led irrigation, and watershed restoration can be scaled up with supportive partnerships, technical assistance, funding, capacity sharing and participatory mechanisms.

Support needed from regional and global partners: Achieving the NDC 3.0 goals requires international and regional cooperation, especially with regard to:

- **Financial resources:** Access to climate funds, including the Green Climate Fund, the Adaptation Fund, and the Fund for Responding to Loss and Damage, as well as bilateral and multilateral support for water sector adaptation investments.
- **Technical expertise:** The Government of Nepal needs technical assistance for NDC 3.0 implementation, focusing on integrated water management, reporting, and understanding the links between water and climate impacts.
- **Capacity development:** Urgent training is needed for local governments, ministries, finance institutions, and community groups – including women, people with disabilities, and Indigenous and marginalized populations – to effectively deliver and maintain water resilience.
- **Knowledge sharing and regional cooperation:** Collaborating with neighboring countries and regional platforms will support the exchange of best practices in water accounting and river basin management.

Integrating water in Nepal's NDC 3.0: Lessons and pathways forward

Lessons from previous NDCs: Experience from earlier NDCs demonstrated the critical importance of cross-sectoral collaboration, cooperation, coordination, inclusive participation, and the effective use of evidence in climate strategy development.

The central role and integration of water in NDC 3.0: Nepal's NDC 3.0 puts water at the center of climate adaptation, mitigation, and addressing loss and damage. Water is thoroughly integrated into climate strategies, establishing connections across agriculture, irrigation, energy, river basin management, disaster risk reduction, and ecosystem management. This integration supports both adaptation and mitigation targets.

Guiding principles for water inclusion: The guiding principles for water's inclusion in NDC 3.0 are rooted in the WEFE nexus, gender and social inclusion, and participatory governance. These principles highlight water's essential role in ensuring food security, energy production, ecosystem health, and inclusive development.

Leadership and stakeholder engagement: Leadership from MoEWRI combined with an inclusive stakeholder engagement process led to the setting of clearer targets for water resource management across major sectors.

Collaboration, *c*ooperation, *c*oordination and partnerships: Moving forward, it will be important to clarify the roles and responsibilities of federal, provincial, and local governments, and to strengthen collaboration and coordination across sectors, actors, and governance levels. This will help advance integrated and inclusive water resource management. Additionally, regional and international partnerships will remain crucial for mobilizing financial resources, technical expertise, and knowledge sharing. Public–private–community partnerships and research innovations are critical for co-designing and scaling context-specific, GEDSI-responsive water-resilient adaptation solutions.

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